ENGINEERING NEWS-RECORD

Steaming up for dedication run over Army's 20-mile access railroad to Fort Leonard Wood

MAY 5 1941

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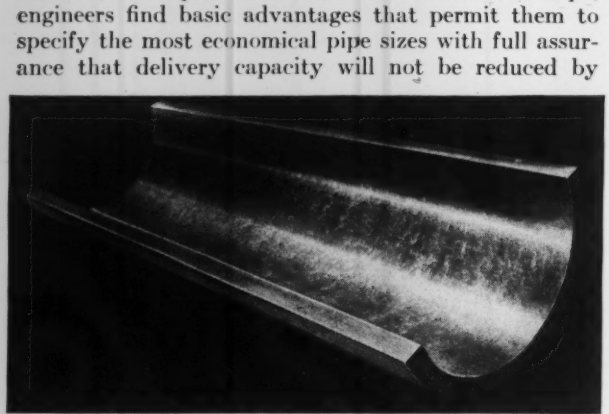
DELIVERY CAPACITY...

and how a non-tuberculating pipe helps keep it at a high level

WATERWORKS ENGINEERS generally agree that a water main, even though it remain structurally intact, may completely outlive its economic usefulness over a period of time. This point is reached when the pipe will no longer carry, economically, a sufficient volume of water to meet demand. Such a condition may arise from characteristics inherent in the pipe itself, from increased demand or from a combination of these two causes. Thus, in designing water systems, the engineer is faced with the responsibility of anticipating and solving these problems.

A Practical Solution

To compensate for expected reductions in carrying capacity, specifications often call for larger sizes of pipe than would otherwise be necessary. However, there is another, less expensive solution. In J-M Transite Pipe, engineers find basic advantages that permit them to specify the most economical pipe sizes with full assurance that delivery capacity will not be reduced by



Transite Pipe provides an unusually smooth interior surface that offers minimum resistance to the flow of water.

tuberculation, the internal corrosion which, even when present in relatively small degree, greatly reduces the carrying capacity of ordinary pipe.

Flow Coefficient C=140

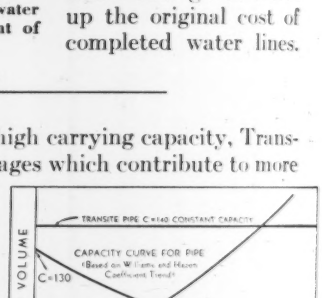
Transite Pipe is an asbestos-cement product. During manufacture, it is built up on a polished steel mandrel that imparts unusual smoothness to the interior wall. Its flow coefficient is conservatively estimated at C=140. This means that Transite water lines start with an exceptionally high carrying capacity.

Economies due to Freedom from Tuberculation

Transite's freedom from tuberculation means that pumping costs stay low, for pressures need not be increased to compensate for steadily decreasing flow coefficient and resulting loss of head in the line. Not only does this advantage provide worthwhile operating economies, but in many cases it also permits the use of smaller diameter pipe with resultant savings in all the numerous items that go to make up the original cost of completed water lines.

Tests conducted by the Pitometer Company on a typical Transite water line revealed a flow coefficient of C-145 in service.

In addition to sustained high carrying capacity, Transite Pipe has other advantages which contribute to more efficient, economical water transportation. In hundreds of American municipalities, it has also played an important part in bringing soil corrosion, joint leakage and electrolysis under control. And in every case low installation costs are assured because of Transite Pipe's long lengths and light weight, and the ease and speed with which Simplex Couplings are assembled.


TRANSITE PIPE C=140 CONSTANT CAPACITY
CAPACITY CURVE FOR PIPE
(Based on Williams and Hazen Coefficient Trend)
C=130
C=110
C=100
TYPICAL DEMAND CURVE
(Based on Rate of Increase of Urban Population for Years 1910 to 1930)
WATER VOLUME
AGE OF MAIN

As water demand progressively increases, carrying capacity of typical water mains is decreasing, thus necessitating cleaning or the providing of additional capacity. This fact definitely emphasizes the importance of Transite's high carrying capacity and immunity to tuberculation.

NOTE TO ENGINEERS: A much more complete discussion of the relationship between tuberculation, carrying capacity and pumping costs is given in the Transite Pressure Pipe brochure, TR-11A. A copy of this book will be sent on request. Johns-Manville, 22 East 40th Street, New York, N. Y.

Johns-Manville TRANSITE PIPE

For efficient, economical water and sewer lines

The Week In Engineering and Construction

ENGINEERING NEWS-RECORD • MAY 1, 1941

Maryland engineering work commands A.S.C.E. attention

Program of spring meeting in Baltimore covered flood control, sanitation, power, bridges and buildings, military road work and current transportation trends

Over a quarter century had passed since the American Society of Civil Engineers had held one of its conventions in Baltimore, Md., so that when this year's spring meeting was held there last week the local members made the occasion a memorable one. Reinforced by a large out-of-town attendance, particularly from Washington where many members have taken up temporary residence for the duration of the defense effort, registration exceeded 1,000. Those who attended the various technical sessions heard papers sponsored by the following divisions of the society—engineering economics, waterways, highways, city planning, structural, sanitary, power and construction. As with all such meetings, program and convention arrangements were in the hands of the local members, among whom J. E. Greiner, F. A. Allner, G. J. Requhardt, E. B. Whitman, H. H. Allen, J. M. Mousson and W. T. Ballard were particularly active. A highlight of the convention was a special train trip to the Pennsylvania Water & Power Co.'s hydro plants at Holtwood and Safe Harbor on the Susquehanna River.

National defense

A feature of the construction division session was the appearance on the program of top officials of the Army, Navy and OPM connected with national defense construction work. Brig. Gen. Thomas M. Robins told how the permanent decentralized organization of the Corps of Engineers has fitted naturally and easily into the defense effort. The Corps' long experience on contract construction (which, General Robins emphasized is the only way to handle work if maximum speed is to be obtained) is being used on airports, fortifications and the Atlantic bases. Negotiated contracts of the cost-plus-fixed-fee type will be used only when plans cannot be prepared in time or where conditions are too risky for the contractor. Otherwise lump sum contracts based on informal competition between selected bidders will be utilized. Discussing what the overall national defense construction effort has accomplished, General Robins pointed out that this has totaled more in a period of seven months than during the eighteen months of our participation in the last war. General Robins also cited four lessons that have been learned during these seven months: (1) a strong, decentralized organization is necessary; (2) careful investigation of sites and preparation of general construction plans should precede any contracts; (3) only minor changes should be permitted after the general plans have been approved; (4) attempting to secure speed by main strength and awkwardness is a mistake.

W. H. Harrison, chief, construction equipment and supplies branch, OPM, paid tribute to the construction industry

(Continued on p. 11)

Work begins on first camouflaged airfield

Grading for runways is underway at Windsor Locks, Conn., Army airfield which will be the first Army port to use dispersion of facilities for concealment and safety. The existing countryside will be disturbed as little as possible to make it difficult to distinguish the airport from its rural surroundings. Tobacco barns seen in picture will be retained for country atmosphere where they are not in runways. Hospital, barracks and work shops will be located inconspicuously in the surrounding woods. Increased cost is estimated at 10 percent due to more extensive utility lines. Only a work hangar will be provided and most planes will be parked under trees.

The U. S. Engineer Department is moving 500,000 yd. of sandy material with its own forces and rented equipment to get a quick start on the three 5,000-ft. runways which will have a paved width of 300 ft. and a total width of 500 ft. The runway paving, a hangar, and 120 buildings (barracks, etc.) will be done under competitive bid contracts. The $3,850,000 project is expected to be complete in 21 weeks from the start of work on March 7.

Headquarters personnel for the Northeast Air District (an area from the Atlantic to western Iowa and from Canada to Tennessee) will be moved from Mitchell Field, L. I., to this section, and will have some office space in downtown Hartford, 12 miles south. Expected personnel is 2,500.

Col. J. S. Bragdon, district engineer U.S.E.D., with offices at Providence, R. I., is in general charge of the work, with Malcolm K. Moore directing construction at the airfield.

Panama Contractors, Inc. includes large firms

Panama Contractors, Inc., low bidder on the $22,000,000 dredging contract for the third set of Miraflores locks at Panama, is probably the largest aggregation of construction talent ever assembled in one group. Panama Contractors represents more resources than the Six Companies which built Boulder Dam; it includes three members of that famed syndicate as well as one from the MWAK group which worked on Grand Coulee Dam.

Leader of Panama Contractors is S. A. Healey, its president, who is represented twice—through S. A. Healey Co. and through Morrison-Knudsen. Healey presently holds contracts on the Chicago subway and New York's Delaware Water Tunnel. Also doubly represented is Henry J. Kaiser, aggregate contractor and cement supplier on Shasta Dam and a member of the Six Companies; both Henry J. Kaiser Co. and The Kaiser Co., which ordinarily operates as the holding company for the Kaiser interests, are included. The other former Six Companies contractor is J. F. Shea Co. Walsh Construction Co., MWAK member and holder of a contract for the new Navy drydock at New York, and the Hawaiian Dredging Co., complete the lineup of Panama Contractors.

This combination—big enough, it is authoritatively said, to bid on the Panama canal itself—seems somewhat unnecessarily big for the dredging contract. Apparently it is intended to bid on the construction of the new locks themselves when this $250,000,000 or so job comes along next year. Already established on the ground, Panama Contractors would be in a good position to go after the job. In fact it is doubtful whether contractors could be found, outside the syndicate, who would be able to tackle a project of this magnitude.

Varied Interests of Henry Kaiser

If this is the case, it would partly account for Kaiser's participation. Under ordinary Panama Canal procedure, the contractors would furnish the steel and other materials, and Kaiser last week announced his intention of going into the steel business. He plans, apparently with RFC financing, to build a $150,000,000 string of steel plants on the West Coast. This project, so far, has got to the stage of seeking a certificate of necessity (which would entitle Kaiser to defense financing privileges from OPM.

Since the administration is anxious for expansion of the steel industry, this plan fits in with Kaiser's method of doing business. His approach has been to insure government support for his enterprises by supporting New Deal economic objectives. Thus he helped the Bureau of Reclamation break the price of cement on the West Coast from $1.40 a bbl. to $1.19 and later $.90 by organizing the Permanente Corp., to manufacture cement. The same corporation is now preparing to offer Aluminum Co. of America its first competition in the production of magnesium—a light metal essential to aircraft production—through the construction of a new RFC-financed plant. When the war boom in shipping arose, Kaiser went into the shipbuilding business through Todd-California Shipbuilding, which had a 60-freighter British order now transferred to this government, and more recently through California Shipbuilding Corp., which is to operate one of the new government-owned shipyards.

Kaiser's steel plan envisages construction of a pig iron plant in Utah, a steel plant using Bonneville power, and a rolling mill in Southern California. Total output would be 1,500,000 tons annually, with production starting in 8 to 12 months.

Army dedicates 20-mile railway to Ft. Leonard Wood

Celebration of one of the greatest feats in modern railroad construction took place April 19 when high-ranking army officers, Frisco Railroad officials and St. Louis business men joined the camp contractors, Klinger-Neumann-Western-Lytle Co., in dedicating the new 20-mile line between Newburg, Mo., and Ft. Leonard Wood. The dedication party rode the first passenger train over the new line—two improvised observation cars pulled by a saddle-tank engine. Torrential rains that had been falling for a week let up just long enough to permit the trip over the line, though the visitors saw raging streams tearing at freshly-placed embankments and testing new bridges.

Construction on the 20-mile line through the Ozark mountains got under way Jan. 26, and in less than three months about 1,500,000 cu.yd. of rock and earth had been excavated, 15 bridges built, including major structures over Big and Little Piney Rivers, all track laid and 18 miles of ballast placed. Mike Curran was superintendent in charge, working under Robt. McCune, general superintendent and Lee Huntley, project manager.

Included in the group of army officials attending the ceremonies were Major-General Geo. V. Strong, commanding Seventh Corps Area; Col. R. L. Cochran, commanding officer, Ft. Leonard Wood; Col. L. R. Groves, operations officer, construction division, Quartermaster General's office; and Maj. Frank Reed, constructing quartermaster, Ft. Leonard Wood. Officials of the contractors present included Forrest Parrott, Arthur H. Neumann and Wm. A. Klinger.

Permissible average cost of defense housing raised

Permissible average cost of defense housing has been raised by Congress from $3,000 per unit exclusive of land to $3,500. The maximum which may be spent on any one unit remains at $3,950. Chief effect of the change is to simplify the administrative situation created when some projects in high cost areas get up toward the peak figure and means must be found for saving somewhere else to hold the average down. The change was also supported by representatives of the leading brick manufacturers.

The amendments to the Lanham Act, as previously described in *ENR*, authorize an additional $150,000,000 for defense housing and require that movable equipment such as refrigerators not be installed in defense housing units unless the "Federal Works Administrator shall, in any particular case, deem such installation to be in the public interest."

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Millions advanced for Central Valley power projects to speedup work

WPA and CCC labor for reservoir clearance discarded in speedup procedure and work will be let on contract basis

Speedup of work on the Central Valley power and irrigation project is expected to permit delivery of power from Shasta Dam's five 75,000-kw. generators in 1944 instead of in late 1945. Of the $13,750,000 by which the President last month increased Central Valley's budget for fiscal 1942, some $10,000,000 is dedicated to speed the work; it does not in itself increase the cost of the project but merely makes the money available faster than originally contemplated. The remainder of the increase is for starting a $15,000,000 steam generating plant newly included in the project. This plant will also require construction of extra transmission equipment and will increase the total cost of the project from $228,000,000 to $263,000,000.

A major change involved in the speedup is abandonment of the present system of doing reservoir clearing with WPA and CCC labor. This work is moving too slowly to permit filling the reservoir at the accelerated rate, and it is now intended to do the work by contract. Probably a number of small contracts rather than one big one will be let.

Plans for Keswick Dam, on which no contract has yet been let, are also being changed. This low re-regulating structure below Friant Dam was originally to have been a mere weir to aid in diversion of fish to tributary streams. Last fall it was decided to build the weir so as to make it usable as foundation for a low power dam to be built later. It is now intended to proceed immediately on the construction of the dam.

Acceleration of work at Shasta is made readily possible by the fact that relocation of the railroad, which has been the bottleneck so far, is nearly finished. The contractor's present mixing plant and tower cableway, it is believed, will be adequate to handle the faster schedule without other than minor additions. It will just be necessary to put more men to work.

There is even less problem at Friant. The contractor there is already moving much more rapidly than the present schedule calls for, so much so that Reclamation was getting a little worried that the work might run ahead of the available money.

Present plans do not necessarily affect the irrigation phases of the work. Whether these will be speeded up along with the dams has not yet been decided.

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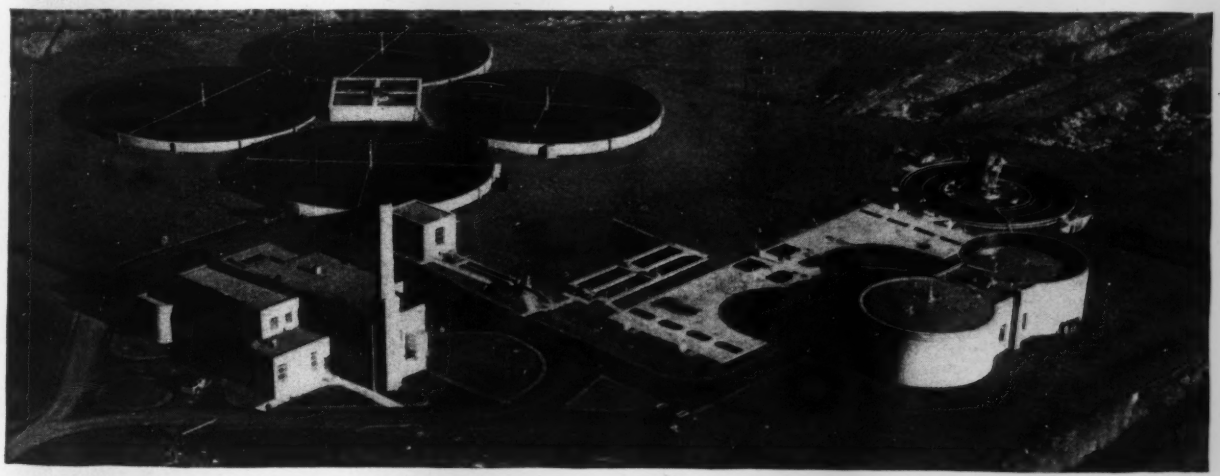
Bill passes Senate to release Boca Dam waters

Water from Boca Dam on the Little Truckee River in California could be delivered to users by the Bureau of Reclamation and the dam put into operation under a bill which has passed the Senate. When Boca Dam was started, the water users association agreed, in the usual manner, to repay its cost up to $1,000,000. Actual cost of the dam exceeded this amount by $80,000, and the water users refused to assume responsibility for the excess. Reclamation, consequently, refused to deliver water from the project. The present bill, would authorize Reclamation to turn over the project without obtaining a repayment agreement.



McLaughlin Air Service

"One for all and all for one" was the spirit behind this million dollar sewage plant

When three adjacent communities in New Jersey were faced with the common problem of providing sewage treatment, they pooled their resources and jointly built a single plant to serve all three. Thus Rutherford, East Rutherford and Carlstadt were able to provide what neither one singly could probably afford—special facilities to treat both domestic and industrial waste, operated by technicians who are skilled in handling the intricate processes.

Because the sewage from this area contains a variety of industrial wastes, the treatment methods include chemical, biological, and mechanical processes. Primary reliance for purification is placed on trickling filters (upper left), preceded and followed by settling tanks; an effluent sand filter is used to give an added "polish" to the plant discharge. Chemical precipitation devices are provided for pretreatment of the sewage when the industrial wastes might overload or interfere with biological processes. Sludge is digested, and filtered after which it can be either incinerated or dried for fertilizer.

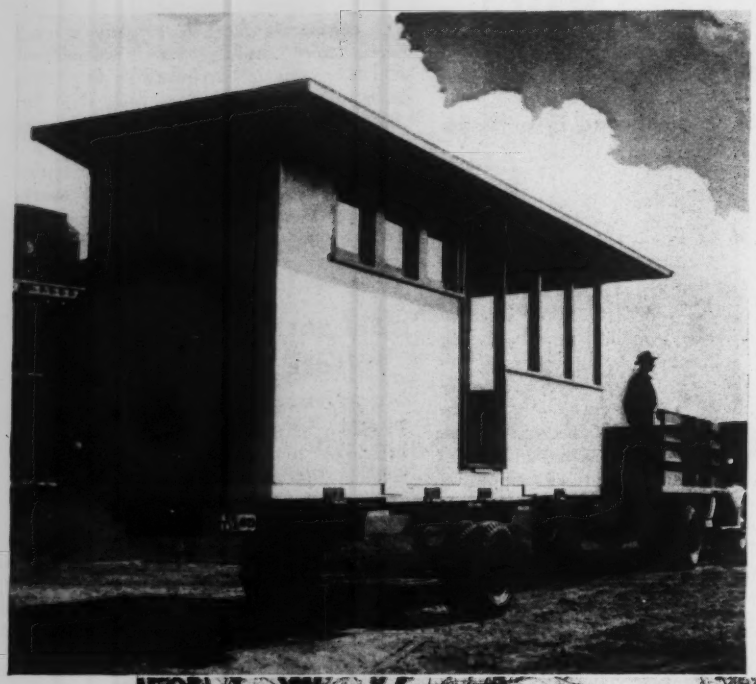
Among the many interesting features of the plant are the potentiometric control of chlorination (by which the rate of feed is automatically proportioned to the chlorine demand, and a plant water system which supplies treated sewage effluent for washing of buildings, for ash-sluicing purposes and for other non-potable uses.

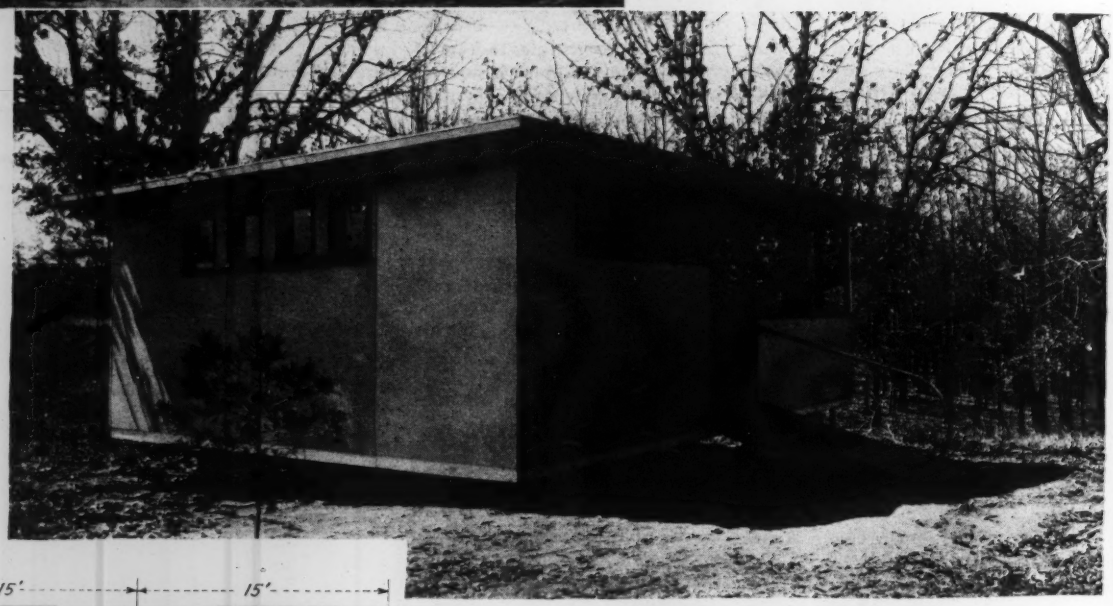
The 4-mgd plant, which cost about $900,000, was designed by Chas. J. Kupper, consulting engineer, New Market, N. J. General contractor on the job was F. H. McGraw & Co. of Hartford, Conn. Plant operation is under the supervision of Albert B. Kozma.

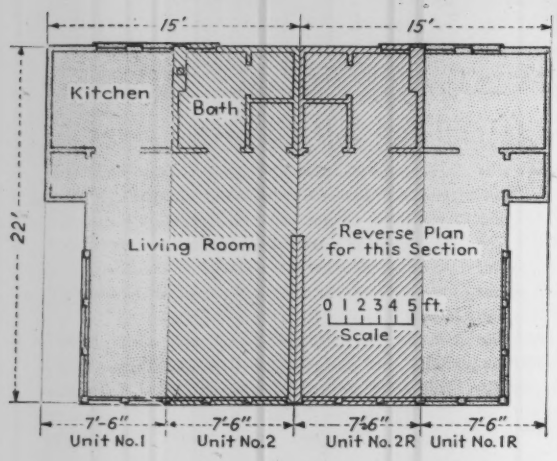
Defense housing ol

Something new in "factory-built" house construction has been developed by the Tennessee Valley Authority. And on these pages we picture TVA's pre-built portable cottage, the units of which will soon be rolling off the production line to fill a 150-unit defense housing order for the Federal Works Agency.

Long an experimenter with low-cost temporary housing needed in connection with dam construction activities, TVA believes that its present scheme of unit-built houses has special value in meeting emergency housing needs. Six houses have already been produced at the fabricating plant in Muscle Shoals, Ala., and the units are erected at Pick-







EASE OF TRANSPORTING UNITS, which measure 7½ ft. wide, 22 ft. long and 9½ ft. high, by trailer to site where needed is shown at top. A three-unit house all ready for occupancy is illustrated immediately above. Using cinder-block piers relatively little foundation work is required. Plan at left reveals how four units combine for a duplex cottage if desired. Units are delivered complete with electric wiring, plumbing, bathroom and kitchen fixtures, windows and screens.

...olls off the production line

wick Dam 60 miles down the river.

The new cottages are built in sections, each being a complete unit of the building to include floors, walls, ceilings, and roof. Also in place is the electric wiring, plumbing, bathroom and kitchen fixtures, windows, screens, doors, and kitchen cabinets.

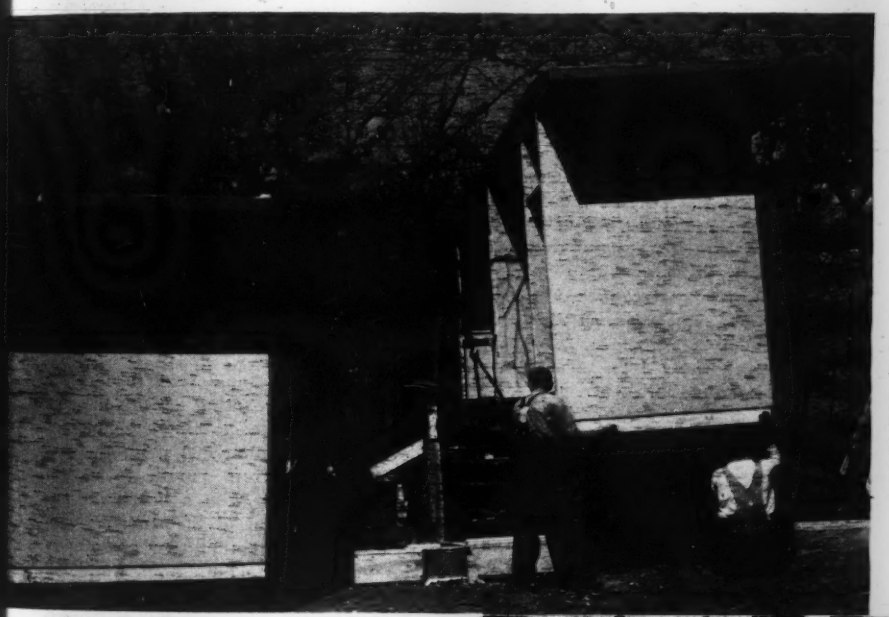
Smaller cottages are in three sections, and the larger ones in four. Each section is 7½ ft. wide, 22 ft. long, and 9½ ft. high, and weighs about 3 tons. The sections, which are fitted together with bolts, are of wood-frame construction with exterior of weatherproof insulating fibreboard.

A single-cottage model consists of a combination living and bed room, kitchen, bath, small bunk room, and screened porch. For vacation use it will accommodate four to five persons. The larger cottage is a duplex, and on each side of the central partition is one large room, a kitchen, and a bath. The cottages are styled in the modern manner or with flat, wide, overhanging roofs. Either of two exterior color combinations are used, buff with tan or gray with green.

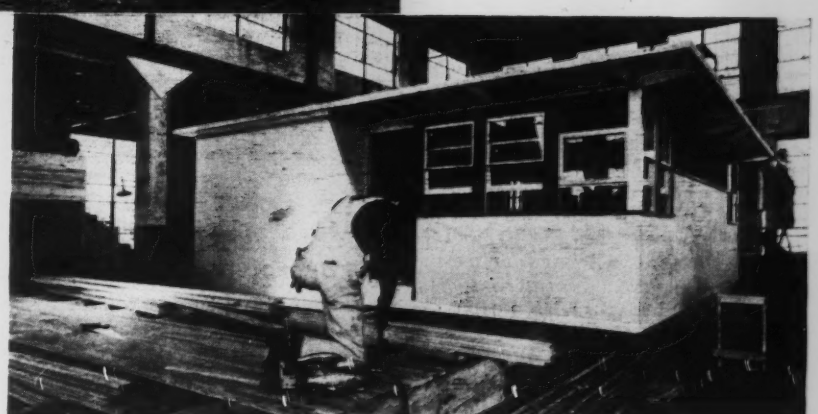
In the Muscle Shoals shop two duplex cottages can be manufactured simultaneously, a total of eight sections. Every section is mounted on small wheels, which in turn are mounted on tracks, so that the section can be rolled from one point to the next in the production process. Twelve to sixteen hours is required to complete a section. The cost, including transportation and field assembly, is reported to compare favorably with the cost of ordinary construction.

Four workmen can assemble the sections into a completed cottage within 4 hours, and the only parts of the cottages constructed on the ground are the supporting cinder-block piers. Dismantling can be carried out in as short a time as the assembling, and a cottage can be transported to another site with no loss except the slight cost of the piers.

Development of the portable cottage was originated by Louis Grandgent when he was connected with TVA as chief of the architectural section. It was completed by the authority under the supervision of Carroll A. Towne, with the assistance of the architectural staff of George Richardson, Harry Gurnee, and Woodruff Purnell and the construction staff under W. B. Richardson. Consultant on the work was Roland A. Wank, principal TVA architect.



WHEN A UNIT REACHES THE SITE it is unloaded from the truck trailer by means of a block and tackle rig. Then it is lowered to a pipe rail track and slid into place. Units are bolted together and four workmen can complete erection of a cottage in four hours. Only construction required on site is that necessary to provide cinder-block piers.



IN THE FABRICATION PLANT sections are rolled from point to point on small wheels which operate on pipe rail tracks, as shown at right. Twelve to sixteen hours are required to construct a section. TVA shop arrangement permits fabrication of two duplex cottages simultaneously, a total of eight sections.

Kentucky highway department to get new offices

Scheduled for completion in June, the new $1,250,000 Kentucky State Office Building at Frankfort will provide new quarters for the Kentucky State Highway Department and other state organizations. Total floor space is 160,000 sq.ft.

The new 12-story building with penthouse was begun in the summer of 1938. It is founded on precast reinforced concrete piles and is 116x249 ft. in plan. The design provides for future addition of an auditorium seating 1,500 people. The building's 190-ft. height will make it Frankfort's tallest office building.

Most unusual feature of the structure is the all-welded steel frame requiring 1,470 tons of structural steel. Exterior walls are of brick as are the interior walls. It is designed for future air-conditioning if desired.

J. H. Graham, dean of engineering at the University of Kentucky, is in general charge of design and construction with the Kentucky State Highway Department in immediate charge of construction. Dean Graham is being aided by Ernst Vern Johnson, architect; Samuel A. Mory, Jr., structural engineer; George H. Sager, Jr., consulting engineer, and John T. Gillig, consulting architect, all of Lexington. J. B. Rieman is project engineer on the work for the highway department.

General contractor is Skilton Construction Co., Louisville, represented on the job by D. Earl Holiday. Spencer & Ross, Detroit, Michigan, with Harry Wyse, superintendent, did the foundation work, which required the casting and driving of about 56,000 lin. ft. of 14-in. piles.

Municipal survey for tin can salvage methods

A survey of municipal methods and facilities for collection and segregation of used tin cans for salvage of the tin in a possible emergency shortage has been recommended to the Office of Production Management by the National Academy of Sciences. The Academy had undertaken a study of the possibilities of reclaiming tin from cans at the request of OPM. It found that although this is technically feasible by well established methods now used for reclaiming tin plate scrap, the cost is so high as to be impractical under present conditions. If, however, a shortage should become so acute—as in the event of cutting off of foreign supplies—that cost could be disregarded, about 12,000 tons could be recovered of the 35,000–40,000 tons of tin now going annually into cans.

Biggest problem in such an eventuality would be the collection of cans reasonably free from other refuse. It would have to be done as a by-product of regular refuse collection and, because of transport difficulties, would be restricted to larger urban centers where de-tinning plants could be located. (*An article on this subject will appear in ENR—May 8 issue.*)

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More money for flood control recommended

Elimination from the War Department Civil Functions Appropriation of the requirement that 10 percent of flood control funds be expended on new projects was recommended last week by the Senate committee. This provision, inserted by the House, was opposed by the Corps of Engineers, which told the committee it would make it necessary to put through an uneconomic 10 percent cut in the amounts allocated to existing projects.

The committee also recommended increasing the appropriation for flood control to cover $1,101,000 for protective works at Huntington, W. Va., additional to the $1,129,000 approved by the House and $450,000 for the Lugert-Altus reservoir. An increase of $5,169,000 is also recommended, of which largest items are $1,500,000 for a seaplane channel in Boston harbor, $1,897,000 for improvement of the Pearl River in Mississippi and Louisiana, and an additional $1,666,000 for the Missouri River between Kansas City and Sioux City.

If Congress retains the requirement that $7,683,000 of new flood control projects be undertaken, the Corps will start the following jobs: Almond Reservoir, N. Y.; Buffalo Bayou, Texas; Wood River Levee, Ill.; Newport, Ky.; Louisville, Ky.; Wolf Creek Reservoir, Ky. and Tenn.; Dorena Reservoir, Ore.; Tacoma, Wash.

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Aluminum priority ratings issued by OPM

Defense use of a major part of the aluminum supply has compelled the Office of Production Management to institute rigid rationing of the amount available for civilian use. The rationing machinery worked out late last month provides for a system of B priority ratings, ranging from B-1 to B-8, which are attached to non-defense orders for aluminum. Each rating entitles the customer to receive a certain percentage of his use of aluminum last year; the percentage varies from month to month. At present orders with a B-8 rating are getting 10 percent of their normal supply of strong aluminum alloy and 50 percent of low grade aluminum, while B-2 ratings call for 80 percent of strong aluminum and 100 percent of normal demand for low grade. B-1 is an emergency rating handled on a special basis.

OPM has issued a list of aluminum uses, designating the priority rating which should attach to each. Among those of interest to the construction industry are the following: Orders for aluminum to go into professional instruments carry a B-3 rating; automotive engines, B-4; portable jib cranes, B-4; all portable tools, B-4; all other construction machinery, B-8; highway lighting reflectors, B-4; most other construction uses rate B-8.

The B-4 rating calls at present for deliveries of 60 percent of strong aluminum and 90 percent of low grade.

Bombproof design data published in pamphlet

Government printing office offers publication containing War Department's suggestions

Engineering data on the design of structures to resist aerial bombardment have been collected, in so far as it is available, by the War Department's fortification section and assembled into a pamphlet released this week through the division of state and local cooperation of the Office of Emergency Management. It is not suggested that such structures actually be built at present, but it is felt that engineers should familiarize themselves with the problem. Moreover, in building new structures, some measures to improve bomb resistance can be taken at little additional cost. The booklet, which can be obtained at a nominal charge from the government printing office in Washington describes what little is known about the behavior of exploding bombs, suggests the factors in bomb-resistance of buildings, and discusses at some length the design of air-raid shelters.

Among buildings, the steel frame type seems most resistant to bombardment. "If connections of the girders and columns are made strong and if the principle of continuity is followed it is possible to design a building in which extensive collapse is very unlikely even under a direct hit." Lightly roofed industrial structures should be so designed that failure of one member will not cause progressive collapse.

Connections of roof members to columns should be strong enough to permit considerable distortion without failure. Skylights should be dispensed with and side windows or artificial light used. Walls of important buildings should be strong enough to resist bomb fragments —about 12 in. of reinforced concrete. Five inches of concrete on the roof will prevent penetration of incendiaries.

Design of shelters is not yet on a scientific basis, but it is possible to make designs which will be safe if not economical. Practice is to provide thickness sufficient to resist penetration and then design for the resulting dead loads. Thus safety against direct impact from a 2,000 lb. bomb requires about 11.6 ft. of Class A concrete while the commonly used 500 lb. bomb will be stopped by a slab 5.2 ft. thick.

It is customary in elaborate underground shelters to provide a "burster slab" close to the ground surface to detonate the bomb. This should extend far enough beyond the edge of the shelter to prevent bombs penetrating the earth and exploding alongside. Ordinary shelters are designed not for direct hit but to resist splinters and impact from a bomb 25 ft. away. Several suggested designs for small shelters of this type costing $250 to $500, are presented. Splinter proof shelters can well be placed in the central floors of steel frame buildings. Interior stair wells or corridors often make good locations. It is necessary in such cases to reinforce the ceiling to carry a debris load.

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Wyoming issues $2,520,000 road refunding bonds

Late last month Wyoming issued $2,520,000 in refunding bonds to retire a ten-year-old highway department debt. Issuance of serial refunding bonds was authorized by the 1939 legislature but until now the state had not exercised the power.

The new bonds will bear interest at 2 percent; the first group maturing April 1, 1944, and will be paid off at the rate of $252,000 annually for ten years.

Centralized buying may be abandoned by Q.M.C.

Indications are that Quartermaster Corps plans to abandon, on most future work, its program of centralized buying of construction material. Instead, it will be left up to the contractor to get material. This is particularly to be the case on lump sum jobs, and it is intended to handle most of the future work on a lump sum basis.

Many contractors have criticized the centralized purchasing plan, partly because it removed timing of deliveries from the control of the contractor and partly because, they claim, it created an artificial bottleneck by freezing out the smaller supplier.

Immediately in prospect is purchase of about 150,000,000 board feet of lumber. This is for additional work at existing cantonments and camps and is independent of the large cantonment program which is likely to be initiated this summer or fall.

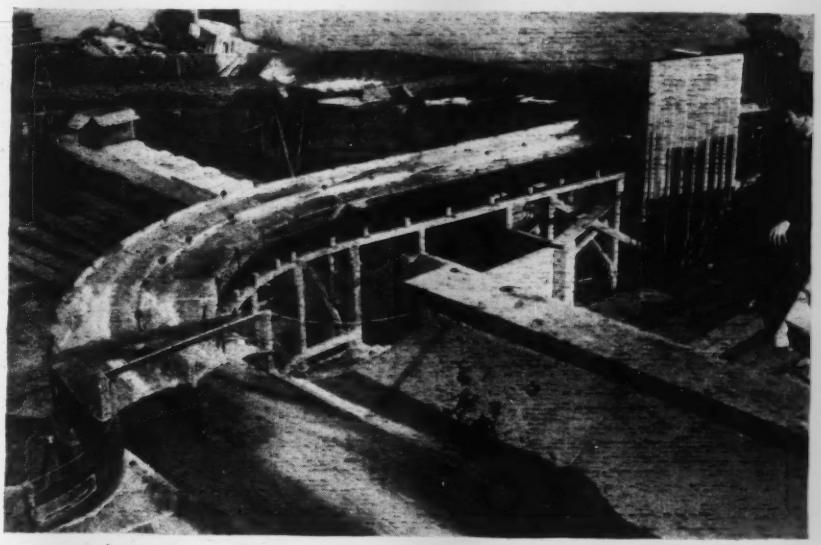


Photo: Acme

Transparent conduit model aids study of flow analysis

To facilitate study of flow conditions in the Park River conduit now under construction at Hartford, Conn., a 1/30 scale model of the upper section has been built of Lucite at the hydraulic engineering laboratories of the Worcester Polytechnic Institute under the supervision of Prof. Charles M. Allen, left, director of the department, assisted by L. J. Hooper of the research staff. This model has been tested by the U. S. Engineer Office of Providence, R. I. in connection with flood control work on the Connecticut River.

The Park River conduit model reproduces the two tunnels of the structure through a run of about 18 ft. (540 ft. in the field). Each conduit opening 12 in. wide by 8 in. high inside represents the 30 ft. wide by roughly 19 ft. high semi-elliptical structure, and at the lower end discharges into a box fitted with a number of hinged gates made of 1¾-in. x 1-in. bars. The gates are adjustable through a range giving equivalent flows through the conduit corresponding to Connecticut River stages from drought to flood. Manometer tubes mounted on a panel on the receiving box are connected with about 24 points in the conduit model to indicate the pressures.

Construction of the conduit, designed to keep flood waters of both the Park and Connecticut Rivers out of Hartford, is now going on under a $2,766,000, 1050-day, contract held by B. Perini & Sons, Inc., of Framingham, Mass. The U. S. Engineers are supervising the work under Lieut. Col. J. S. Bragdon, district engineer.

MEN AND JOBS

W. H. SUNDERLAND, city engineer for four years of Hiawatha, Kan., has resigned to go to Topeka to become assistant engineer in the division of water resources of the state board of agriculture.

WILLIAM SCHLUETER of Watertown, Wis., has been named city plumbing inspector and superintendent of the city sewage disposal plant at Watertown.

LAWRENCE M. SMITH, Ashland County (Ohio) deputy engineer for 12 years and previously assistant city engineer at Ashland, has resigned his position to accept a civil service post in the design department of the floor control service of the U. S. War Department at Louisville, Ky.

L. STERLING HEDGPETH, who for the past ten years has been associated with the Public Roads Administration, San Francisco district headquarters, has accepted an appointment as associate civil engineer with the U. S. Army Engineers in San Juan, Porto Rico, for work in connection with the design and construction of army air bases on that island.

H. M. HALE, head of the operations division, office of the Constructing Quartermaster, Zone 2, New York, has resigned to join the Bayonne Associates, the firm set up by the Great Lakes Dredge & Dock Co. and the George H. Flynn Corp. to build the Navy drydock at Bayonne, N. J.

WILLIAM T. WRIGHT, structural engineer of Los Angeles, Calif., member of the firm of Kistner, Curtis and Wright of San Diego and Los Angeles and of Kistner and Wright, architects and engineers of Los Angeles, has severed his connections with these firms. He has been called to active duty as lieutenant in the Civil Engineering Corps, and is now stationed in the district public works office at San Diego, Calif.

Appointments to the engineering staff of the Pennsylvania Department of Highways have been announced as follows: LEWIS W. WHITTALL of Brookville, Pa., project engineer, district No. 1, Franklin; MERLE R. APGAR, of Towanda, project engineer, assigned to district No. 4, Scranton.

DR. JOHN H. A. BRAHTZ, head of the photoelastic laboratory of the U. S. Bureau of Reclamation in Denver, has gone to San Francisco to take up active duty with the U. S. Navy. Dr. Brahtz will assume the rank of lieutenant commander and will act in an advisory capacity for all naval construction connected with the twelfth naval district headquarters at San Francisco. In his capacity with the Bureau of Reclamation Dr. Brahtz had charge of the testing of stresses obtained in various materials and his work with the Navy will follow the same trend.

H. R. CHEARS, well-known builder, of Memphis, Tenn., has been elected chairman of the city planning commission to replace S. TATE PEASE, who recently resigned to become acting state administrator of the WPA. MAX H. FURBINGER was named vice-chairman.

DR. WEBSTER NEWTON JONES, dean of the school of engineering at the Carnegie Institute of Technology, has been appointed to the recently created State Defense Council, a body of eleven members with Governor James as chairman, which will be charged with coordinating defense reports in Pennsylvania with the federal government's defense plans.

ROBERT REYNOLDS of Hayti, Mo., recently assumed his duties as city engineer for Blytheville, Ark., and is supervising the construction of an extensive WPA paving project in Blytheville.

HERMAN B. WOLF, of Charlotte, N. C., has been named superintendent of maintenance, for the Duke Power Co., succeeding the late Frank L. Moser. J. E. CHAPMAN, also of Charlotte, has been appointed assistant superintendent in charge of construction. Mr. Wolf has been with the company for 25 years and Mr. Chapman for 30 years.

HARRY TUCKER, professor of highway engineering and director of the engineering experiment station at North Carolina State College, has been appointed a member of the North Carolina Utilities Commission by Governor J. M. Broughton, and will be given a leave of absence by the College for the period covered by his appointment.

LOYAL SMITH has been named assistant city engineer at Walla Walla, Wash., succeeding C. W. COTE, who resigned. He is a graduate of Whitman College.

EARL E. WOERFEL of Manitowoc, Wis., has been appointed general manager of Walter W. Oeflein, Inc., general contractors of Milwaukee. Mr. Woerfel was formerly a sales engineer of the Kalman Steel Co., and was also with Hamann Construction Co., of Manitowoc.

T. FRASER JAMES, safety engineer for the South Carolina Public Service (Santee-Cooper) Authority, has been ordered to active duty as a lieutenant in the United States infantry at Washington. His army duty will be in connection with safety work.

WALTER T. NORRIS, former sales and designing engineer for the Moore Dry Dock Co. of Oakland, Calif., has been appointed Pacific Coast district engineer for the American Institute of Steel Construction, with headquarters at San Francisco.

C. J. KNUTSON, formerly area engineer for WPA at Duluth, Minn., has resigned to enter private practice with the firm of Ford, Bacon & Davis, New York consulting engineers.

JOSEPH L. DRUECKE of Milwaukee has been appointed engineer for the village of Elm Grove.

CAPT. GLEN W. TRINDAL, F. A., formerly of Milwaukee, Wis., has been appointed assistant zone constructing quartermaster, Zone No. 1, Army Base, Boston, Mass. ROBERT E. WILLEMS, of the Akron city engineering staff, has been named by Ohio state highway director Hal G. Sours to assume complete supervision of the state's multi-million dollar highway program in Cleveland and Cuyahoga, Lake and Geauga counties, to succeed FRED R. WILLIAMS, who has been transferred to the position of coordinating engineer for the Cleveland planning office.

The following transfers are effective in the Civil Engineering Corps of the U. S. Naval Reserve:

LT. HORACE ROY WHITTAKER, State College, Pa., has been ordered to active duty in the Bureau of Yards and Docks, Navy Dept.

LT. JOSEPH B. WILSON, Salisbury, N. C., has been ordered to active duty at the Naval Air Station, Corpus Christi, Tex.

LT. HENRY WILLARD CHUBBUCK, Fairfield, Conn., has been ordered to active duty in the office of the Resident Officer-in-Charge, Contract NOy-4505, Orange, Texas.

LT. PETER CORRADI, New York, N. Y., has been ordered to active duty at the Navy Yard, Portsmouth, N. H.

LT. EARL G. DOBBINS, Chattanooga, Tenn., has been ordered to active duty at the Marine Barracks, Parris Island, S. C.

MEN at WORK

bove: In charge of construction at Camp elby, recently completed on time and below st, was dynamic Capt. C. L. BUCKNUM, nstructing quartermaster. A native of hiladelphia, and an engineering graduate of e University of Pennsylvania, he came to the uartermaster Corps from the U. S. Army Re-rves.

Below: ED NIMMERGOOD, superintendent, American Bridge Company on the Pit River Bridge (left), goes over some of the problems of the job with D. R. PATTERSON, principal inspector on the bridge for the U. S. Bureau of Reclamation. This $6,000,000 structure with upper deck some 500 ft. above streambed, is a controlling factor in completing the 30 miles of relocating railroad around Shasta reservoir.

Above: With moving in to start this summer, J. B. RIEMAN (left) project engineer for the Kentucky State Highway Department on the $1,250,000 state office building (illustrated in this issue) at Frankfort, and D. EARL HOLIDAY, superintendent for the general contractors, Skilton Construction Co., Louisville, discuss interior finishing details. Their job is a 12-story all-welded steel frame structure. It will provide 160,000 sq. ft. of floor space and will be Frankfort's tallest office building.

At right: Tunnels are rare in Kansas, but BERNARD (WOODY) WILLIAMS, superintendent for Utah Construction Co., found one to drive for the diversion and outlet works of the Kanopolis Dam on the Smoky Hill river near Salina.

Above: F. W. PANHORST, bridge engineer, California Division of Highways, has recently stepped up his design organization something like 50 percent to make plans and estimates on a large number of structures that will be incidental to the proposed "access road" program in California required as supplements to the "strategic network." Pending arrangements for financing the work itself, surveys and estimates are being carried out for access road projects with funds allocated from Federal aid moneys assigned to California. Bridges, overpasses, grade separation projects and other work coming under the head of "structures" make up almost half of the $28,558,000 in the tentative list of California's access road needs.

right: DALE HEINY, chief op-ator, and WILLIAM MATHEWS, perintendent of the Gary, Ind., al disposal plant where garbage d sewage are mixed and treated combination. Bill Mathews, for ny years a resident engineer for ord, Burdick and Howson was in rge of plant construction and he came so intrigued with the pos-bilities of dual disposal that he yed on to superintend operations.

Serious water shortage centers in Ohio Valley

The outstanding deficiency in stream flow in the East-Central States is now 6 months old and unless halted by plentiful rains is leading toward a serious drought with respect to surface and ground water supplies. There was a tendency during the last month for the water shortage to lessen in severity in the southern part of the East-Central States but to become more aggravated in the central Mississippi Valley States.

The flow of five representative streams in Missouri, Illinois, Indiana, Ohio, and Kentucky range from 10 to 22 percent of normal (median or mid-value) for March. The flow of the Gasconade River at Jerome, Missouri, and the West Fork of White River at Noblesville, Indiana, receded to the lowest March flow of record. The total runoff since October 1 in a 280,000 sq.mi. area centering around Kentucky and generally coincident with the lower Ohio River Basin averaged 35 percent of normal.

Storage reservoirs in the affected area have been heavily drawn upon, creating a condition not favorable for hydro-power generation and in some communities the deficiency is creating apprehension of shortages in water supplies.

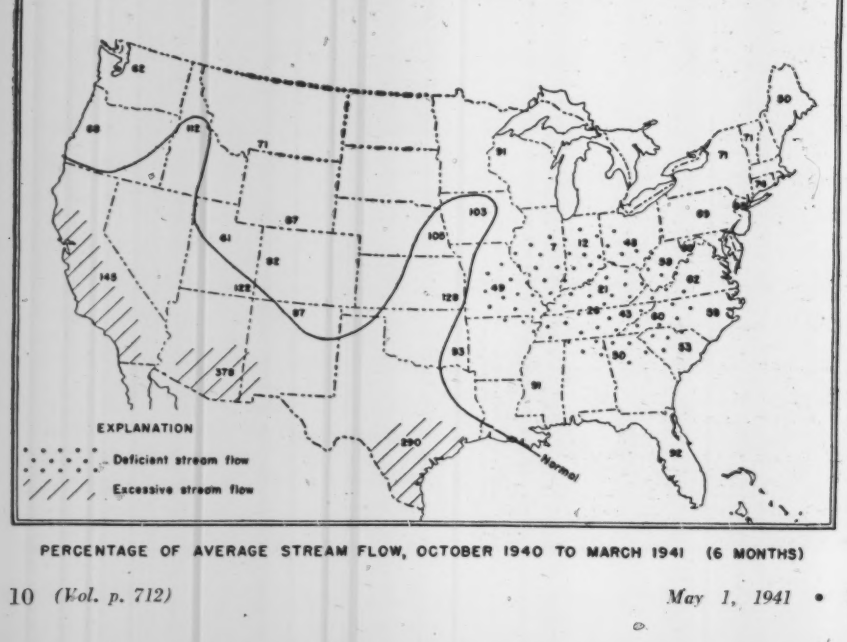
In the northern Intermountain region subnormal stream flow in conjunction with temperatures above normal indicate a subnormal snow cover and a prospective short-water yield for irrigation needs in parts of that region.

In contrast to this widespread deficiency, water supply conditions are unusually favorable in the Southwest from Texas to California. In New Mexico snow storage conditions were reported very favorable in the headwaters of the San Juan and Rio Grande. In Arizona the flow of the Gila River near Solomonsville is more than four times the March normal. Reservoirs on March 31 in Arizona are nearing their full capacity levels and the water stored is well over 10 times the amount stored on the same day last year. The flow of the Colorado River into Lake Mead draining the central intermountain region averaged 115 percent of normal during March.

Southern California has experienced the greatest seasonal rainfall since 1889-90. The rains have been well distributed so that damaging floods have been avoided and a high percentage stored in the ground, and thus contributing to the irrigation and municipal supplies. In the San Joaquin Basin the flow of the Kings River averaged 160 percent of normal during March.

Situation in the Tennessee Valley

Norris Reservoir today is at El. 988, which is almost exactly the elevation of this reservoir on the same date last year. Hiwassee Reservoir is now at El. 1478, which is the normal elevation for this date. The main river reservoirs are all filled to the maximum elevations allowable for power storage. A recent storm has averaged from 1½ to 2 in. of precipitation over the entire eastern half of the Tennessee River drainage area, which will tend to improve conditions. At present the power load is being carried by TVA main-river hydro and steam plants and all available streamflow is being stored in the tributary reservoirs. There is ample water in sight for navigation purposes. The authority anticipates no trouble in meeting contractual load and with normal rainfall should be able to continue the supply of emergency power to meet deficiencies on the system in the surrounding area.



PERCENTAGE OF AVERAGE STREAM FLOW, OCTOBER 1940 TO MARCH 1941 (6 MONTHS)

Production started at Charlestown powder plant

Construction at the Charlestown, Ind. powder plant for the U. S. War Department has advanced sufficiently to permit production operations to be started April 24, a month ahead of schedule.

When completed, the Charlestown project will be the largest powder producing plant in the world. It is the second of the country's big three powder plants to begin operation. The first to start was the plant at Radford, Va., and the third plant is located at Childersburg, Ala., where production is due to start this summer.

The Charlestown plant will have six production lines, each with a capacity of 100,000 pounds of powder daily. Two lines went into production on April 24, two more will be started in May, and the last two in late summer.

Construction of the new $90,000,000 Charlestown plant was begun last September. The project is being constructed by E. I. du Pont de Nemours & Co. for the U. S. Ordnance Department and will be operated by the duPont Co.

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Martin plane plant work approaching completion

The contract for $24,275,000 of additional bomber manufacturing facilities at the Glenn L. Martin plant near Baltimore, Md., which was approved two weeks ago by OPM, was merely a financial transaction to reimburse the company for construction that is rapidly approaching completion. Newspapers have reported this contract as if it were for new construction. The money covers principally a Navy flying boat building 400 x 1,000 ft. in plan and two stories in height, which is now completely enclosed, and an Army B-26 bomber building of 1,181,000 sq. ft. floor area and also two stories high, upon which the last steel is now being erected.

On all of this work the Glenn L. Martin Co. is itself the general contractor, maintaining supervision and control through its building and field engineer, Paul E. Tignor. In our issue of March 27, 1941, p. 453, an item describing the above construction work stated that it was being handled by Consolidated Engineering Co. This was in error, as Consolidated is one of the 34 subcontractors working under Mr. Tignor, and handles only the foundation, masonry and carpentry work.

The Baltimore plant building, completed or under construction, have a total floor area of 4,000,000 sq. ft., and by a year from now plant personnel will total 42,000 persons.

A.S.C.E. Spring Meeting Held in Maryland

(*Continued from p. 1*)

the construction branches of the y and Navy for what he styled "magnificent" accomplishment. He ted out that the Army command ing for 1,200,000 men is about com- d; that the Army airfields are about completed; that the Navy bases are ewhat over half completed; and that munitions plants and storage depots, h involve a somewhat longer con- tion period, are well along.

telling of the work of the Navy's eau of Yards and Docks, Commander R. Dunlap pointed out that the Navy quite by accident, a strong decen- zed organization at the time the de- effort began; the "accident" rested fact that Congress had so cut Navy propriations that much of the Wash- ton personnel had had to be sent to various naval districts. The Navy's of negotiated cost-plus-fixed-fee con- ts, under which field officers are n almost absolute decentralized con- has worked so well that no changes contemplated.

Col. Hugh J. Casey pointed out the construction division of the e of the Quartermaster General is with advance planning of a new gram of cantonments and munitions ts, which will permit an improve- t over the program that is now ap- ching completion.

Bridges and buildings

he many unique design and construc- features of the Potomac River dge at Ludlow Ferry were described H. H. Allen, vice president, J. E. iner Co., the consulting engineers, by others of his staff including C. M. e. W. H. Pahl and Raymond Archi- , the latter having recently been ointed senior structural engineer, sion of tests, of the PRA. A long dge of Wichert truss and girder type, Ludlow Ferry Bridge, notable for its pile supported piers, which were red in huge prefabricated forms ed to the site and sunk, and for its sual steel erection methods, has been cribed in *ENR* Feb. 29, 1940, p. 306 Feb. 27, 1941, p. 320.

uildings were represented on the gram by a paper by Paul E. Tignor, the Glenn Martin aircraft factories by a paper by Herman F. Doeleman the 85-year-old roofs over the House Senate Chambers of the U. S. Capi- Mr. Tignor described the tremen- building program that has brought Martin factories up to a total of ly 4,000,000 sq.ft. of floor space, the osure for which has incorporated y unusual structural features, as described in several articles in *Engineering News-Record*, Dec. 9, 1937, p. 941, June 22, 1939, p. 834, March 27, 1941, p. 453. Mr. Doeleman, consulting engineer of Baltimore, who made one of the four separate engineering investigations of the House and Senate Chamber roofs, described the results of his studies. The condition of the interesting old wrought and cast iron trusses and bracing, as well as the temporary supports that have been erected, pending construction of a new roof, were described in *ENR* Jan. 23, p. 137. Both the speaker and those who discussed the paper, F. H. Frankland, American Institute of Steel Construction, W. W. Pagon, consulting engineer of Baltimore, T. R. Galloway, structural engineer with the Consolidated Edison Co. of New York, agreed that the roof structures were badly designed by modern standards, but Mr. Galloway, particularly, paid tribute to the early designers whose structures have stood so long despite the "poor" design.

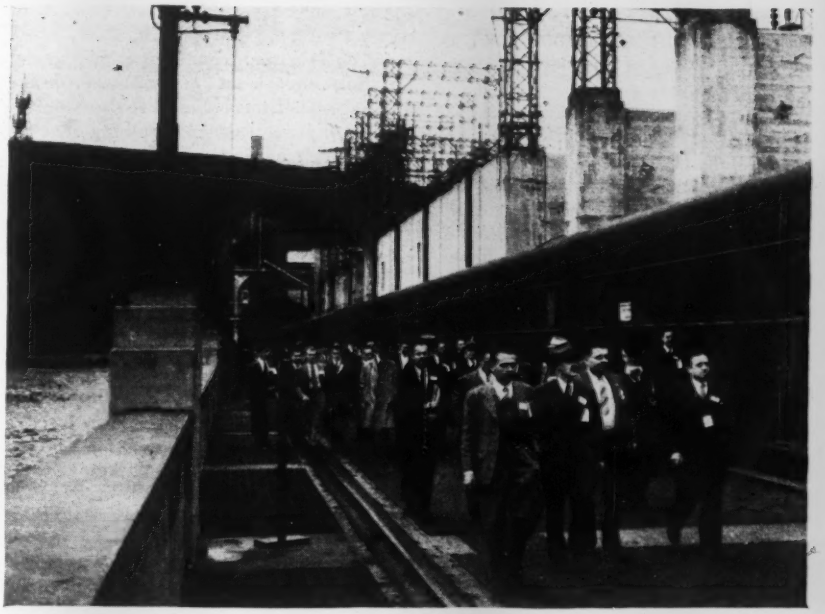
Another bridge article on the convention program discussed the use of a brass spring model to determine the stresses and deflections in the continuous truss (332-456-332 ft. spans) used in the new Susquehanna River crossing at Havre de Grace, Md. The work was done by Prof. William J. Eney, Lehigh University, and in his paper, Professor Eney described how, as an outgrowth of the model studies, improvements have been made in the design of such brass wire models as to simplify their construction and improve the accuracy of the test data. Models of this type, which were developed by Anders F. Bull (*ENR*, Dec. 8, 1927, p. 920), utilize brass rods for truss members in which special springs are inserted to permit changes in length of the model members. These springs, made up of a soldered assembly of flat brass strips previously, are bolted together in Professor Eney's design. This permits rapid assembly of models, also the re-use of the spring materials.

In discussing the paper, Mr. Bull praised the improvements and urged that, with the labor of model making thus reduced, more engineers experiment with brass wire models.

Another discussion of the paper was by Prof. E. K. Timby, Princeton University, who urged a greater interest in model analysis and particularly encouragement and support for this type of work by the various federal agencies that are concerned with structural developments.

Airport on liquid mud

Baltimore's 360 acre airport on the north shore of the Patapsco River contains 300 acres of mud fill deposited inside of a bulkhead in from 6 to 18 ft. of water. It was a poorly selected site from an engineering and financial standpoint, and W. Watters Pagon, consulting engineer of Baltimore, described the difficulties that are being encountered



Civil engineers inspect Safe Harbor hydro-electric plant

Several hundred members of the American Society of Civil Engineers visited the hydro-electric plants of the Pennsylvania Water and Power Co. on the Susquehanna River during the spring meeting of the society last week. At the Safe Harbor plant their special train was run out on the intake structure back of the power house.

in getting a substantial base for the runways; difficulties, however, that are being overcome by a scientific and ingenious application of advanced soil mechanics principles.

Novel Venturi installation

Leon Small, water engineer, Baltimore Bureau of Water Supply, described an interesting installation of a 108-in. Venturi meter in one of the two filtered water conduits at the Montebello filtration plant. Unusual features of the work included bulkheads designed for 20 lb. per sq.in. pressure placed either side of the installation; a temporary 54-in. steel bypass line; and, particularly, the use of cast iron ring sections of various diameters to form the skeleton outline of the Venturi tube contour which was then filled out by successive layers of Gunite to form an integral part of the existing concrete conduit.

Transportation trends

Transportation trends were considered broadly in two papers before the engineering economics division, but major emphasis was placed on railroads. Joseph B. Eastman, chairman, Interstate Commerce Commission, noted that until recently regulation of the railroads had been essentially the regulation of monopolies but that with the advent of commercial trucking, regulation has begun to change over to control of competitive practices. J. E. Teal, transportation engineer, Chesapeake & Ohio Ry., reviewed briefly the development of all major forms of transportation as the background for comment on some of today's transport problems. Mr. Teal disagreed with Mr. Eastman's opinion that rates must be based on the cost of the service rendered. He holds that there are too many unknowns to make such cost determination possible, and stated that transportation needs as a whole will be better served by a rate system designed to meet the aggregate of all costs by rates arrived at on the basis of what the traffic will bear.

Highway transportation was considered from the defense angle in the highway division meeting. Ezra B. Whitman, chairman, Maryland State Roads Commission, told of Maryland's problem in meeting the normal needs and of the relation of those needs to military requirements. Maryland has to provide traffic facilities for an amount of through traffic that is out of all proportions to the amount of federal aid that the state gets when that aid is computed on the normal basis. As a result any extra work to meet military needs puts a peculiarly difficult problem up to the state.

Col. F. C. Godfrey, chief of the operations and training section, office of the Chief of Engineers, gave an illustrated talk on how army units are being organized and equipped for military road work. Commenting on Colonel Godfrey's paper, William N. Carey, St. Paul, gave more information concerning the road-building equipment of engineer units and expressed the belief that these units could be given valuable training in the use of such equipment by setting them to building some of the much needed airports.

Flood control

The waterways division centered its attention on flood control, first taking up the question of how to determine the benefits that accrue from the construction of flood control works, and then turning to the subject of estimating the amount of water to be handled in leveed areas and the types of pumps and other facilities required for pumping the accumulated drainage over levees. E. W. Digges, senior engineer, U. S. Engineer Office, Baltimore, contributed the paper on computing flood benefits, and Gordon R. Williams of the same office prepared a paper on drainage from leveed areas. J. Thornton Starr, also of the Baltimore U. S. Engineer Office, described the 6,600-ft. long concrete pressure conduit built to carry Tobey Creek to the Susquehanna River near Wilkes-Barre, Pa., and Robert T. Regester, consulting engineer, Baltimore, told of the several pumping plants built in the Wilkes-Barre region to pump sewage and storm water over the levees at time of flood.

Local sanitary problems

Regional sanitation problems were taken up at the sanitary division meeting where Robert T. Regester, in a paper prepared jointly with Gustav J. Requardt, described the newest addition to Baltimore's disposal works. Activated sludge treatment has been added to the treatment provided by the old trickling filters at the Back River sewage disposal plant to increase its capacity. The original plant was a pioneer in works designed to get a high rate of purification, Mr. Regester said, and the new plant likewise contains innovations in the design of plants of this type. C. E. Keefer, Baltimore bureau of sewers, said that few problems have developed since the plant was put into service. There has been some trouble with bulking of sludge.

An unusual organization problem was recounted by Harry R. Hall, chief engineer, Washington Suburban Sanitary District, who told how that district has succeeded in providing water and sewers for the suburban communities in Maryland bordering on the District of Columbia without putting an abnormal load on the home owners. These communities, because they are scattered, require twice the mileage of water mains required for a normal community of the same population, yet by careful programming of work and good financing the cost [illegible] water and sewers and refuse disposal [illegible] been kept at about the normal rate.

A paper on the control of pollution in the oyster-growing areas of Chesapeake Bay by George L. Hall, chief engineer, Maryland department of health, rounded out the discussion of local sanitary problems.

Utility financing

Recent trends in public utility financing were discussed before the power division by W. C. Gilman and Philip Sporn, New York. Harry A. Wiers, general office engineer, Tennessee Valley Authority, reported on current trends in the power development program of TVA. Noteworthy, he said, is the effect that defense requirements have had on the power plans of the TVA. Initially most emphasis in TVA operations was placed on flood control and navigation but now attention is centered on speeding up the completion of power plants.

Power plant design

Somewhat as a preview to the afternoon trip to the power plants at Holtwood and Safe Harbor, L. M. Dan, hydraulic test engineer, Pennsylvania Water & Power Co., gave a review of the model tests of hydraulic structures for those projects. The large flood flows to be handled in the Susquehanna River exceeding 800,000 cfs. in some seasons called for very thorough studies of the spillway design.

Thursday afternoon the power division, joined by a large number of others in attendance at the convention, went by special train to the Holtwood and Safe Harbor plants of the Pennsylvania Water & Power Co., some 60 miles away on the Susquehanna River.

New treasurer elected

The board of direction, at its meeting, elected Charles E. Trout, New York, treasurer to succeed the late Otis E. Hovey. The board appointed a committee to participate in current studies of post-war activities to offset the effect of the decline in defense work, the committee to give special attention to the functions of civil engineers in such activities. The president and secretary were named to represent the society on a conference committee of similar officers from the other Founder societies to plan any joint action that may be needed with respect to the engineering profession in the present emergency.

Establishment of a joint office in Washington in cooperation with the American Society of Mechanical Engineers and other of the Founder societies was authorized by the board. No [illegible] representation is planned, simply a central office for representatives of the societies in Washington.

Engineering Services Contributed by Industry

In meeting criticism regarding fees aid contractors for supervising defense onstruction work, Brig. Gen. Brehon omervell, construction chief of the rmy Quartermaster Department, last eek told the Senate Defense Investiating Committee that two industrial oncerns had contributed their services the basis of $1 paid for each 0,000,000 involved in the construction the project.

The Chrysler Corp. was paid $2 for chitect, engineering and management rvices in constructing the governent's $20,000,000 tank plant at Detroit, hile the Humble Oil Co., received $1 r similar services on a $10,000,000 dnance plant at Baytown, Tex.

These fees paid to Chrysler and umble compare, General Somervell id, with a maximum of about $700,000 aid one contractor on a much larger oject.

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Florida law increases truck load limit

The Florida legislature has overwhelmgly overridden a two-year-old veto by rmer governor Fred P. Cone limiting load limit of trucks over Florida ghways to 18,000-34,000 lb.

The new law allows an increase for gle trucks from 18,000 to 24,000 , and permits trucks with semi-trailers increase from 34,000 to 40,000 lb. Heavier trucks must pay special license of $50 a year and will produce an imated $400,000 for state road repairs.

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Alabama raises highway personnel salaries

Alabama's highway department has ected a salary increase for nine classes highway employees. This step was en after highway director Chris Sher- had appealed for such action to t exodus of engineers and other workto better paid defense jobs; 171 hav resigned within the past 90 days.

The scale of increases provided are follows: senior highway foreman, m $100-$140 to $115-$150; highway erintendent, from $140-200 to $160-; senior motor equipment operator, m $70-$100 to $80-$100; principal moequipment operator, from $90-$125 $110-$150; junior engineering aide, m $60-$110 to $70-$110; senior engiring aide, from $90-$140 to $110-0; junior engineer, $100-$160 to 0-160; assistant engineer, from $140-0 to $165-$200, and associate engi-. from $175 to $225 to $210-$240.

JOBS OF THE WEEK

ARMY POST, Fort Knox, Ky.

Whittenberg Construction Co.; Struck Construction Co.; Highland Co., Inc. and George M. Eady, Co., Louisville, have been awarded supplemental contract for constructing additional housing, hospital and water facilities for armored force. War Department announced contract at $3,736,735. Havens & Emerson, Cleveland, O. have architectural and engineering contract.

MARINE BASE, New River, N. C.

Goode Construction Co., Blythe Brothers, and Harrison-Wright Co., all of Charlotte, were awarded contract for the construction of marine base, including tent camp, barracks, mess halls, officers quarters, storehouses, hospital, and administration building for Bureau of Yards & Docks, Navy Department, Washington. Estimated cost is $13,000,000. George Watts Carr, Durham, is architect, J. E. Greiner Co., Baltimore, Md. is engineer.

SHIPWAYS, Los Angeles, Calif.

California Shipbuilding Corp., Los Angeles, Calif. will construct six ways at $4,330,000. U. S. Maritime Commission awarded contract.

SUPERSTRUCTURE FOR STATE STREET BRIDGE, Chicago, Ill.

Overland Construction Co. was lowest bidder for constructing superstructure State Street Bridge, over Chicago River, when bids were opened April 14. O. Hewitt, Commissioner Public Works, Chicago took bids. Low offer was $1,276,848.

ROADS, Connecticut

State Highway Commission, Hartford, will construct shoulders on 245 miles defense highways, including brush clearance, excavating, relocating guard rails, and extending culverts, by WPA labor, $2,235,389. William J. Cox, commissioner highways.

SHIPWAYS, Tacoma, Wash.

Seattle-Tacoma Shipbuilding Corp., Seattle, awarded contract 5 additional ways at shipyard here to General Construction Co., Seattle. Estimated cost $3,500,000. U. S. Maritime Commission will finance.

DEFENSE HOUSING, Wichita, Kan.

Hahner & Foreman, and Walter Armagost Construction Co., have been awarded contract by Public Buildings Administration for four hundred units for defense workers. Estimated cost $1,119,000.

BOMBNG PLANE MANUFACTURING PLANT, Ypsilanti, Mich.

J. A. Utley, Royal Oak, Mich. has been awarded contract for foundation of manufacturing plant to make bombing planes for Ford Motor Co., Dearborn, Mich. Total estimated cost $10,988,000. Albert Kahn, Inc., Detroit, Mich. is architect. War Department will finance.

GRADE ELIMINATION, New York

Department Parks, Central Park, New York, N. Y. awarded contract grade elimination at intersection of connecting highway and Triborough Plaza, to J. Leopold & Co., New York, $1,219,794.

DREDGING IN PANAMA CANAL, Canal Zone.

Panama Constructors, Inc., White Plains, N. Y. will remove 30,000,000 cu. yd. material at new Miraflores Locks, Pedro Miguel Locks, and north approach, to Pedro Miguel Lock—Third Lock Project, by General Purchasing Officer, Panama Canal, $22,436,086. The Panama Constructors include: S. A. Healey Co., Chicago, Ill.; Walsh Construction Co., Davenport, Ia.; H. J. Kaiser, Oakland, Calif.; The Kaiser Co., Oakland, Calif.; Morrison-Knudsen Co., Boise, Idaho; Hawaiian Dredging Co., Honolulu; J. F. Shea, Co., Baltimore, Md.; and George Betchel, Los Angeles, Calif.

NOTE—Additional bidding and contract news on over 800 projects large and small appear in the Construction News section beginning on page 16.

Georgia highway budget set at $11,000,000

Governor Eugene Talmadge of Georgia has approved an $11,000,000 highway budget, which calls for drastic reductions in administration and operating expenses for the final quarter of the current fiscal year.

Although the budget carved several hundred thousand dollars from the expenditures of the highway department as compared with the same quarter last year, it provides that construction of federal-aid highways, grade crossings and WPA projects be continued.

Operating expenses were slashed from $532,187 for the same quarter last year to $261,913, and maintenance expenses were cut from $489,241 to $375,000. The budget sets up $6,479,611 for federal-aid highway construction for which contracts must be let by June 30. It also provides that the state will contract for $2,846,076 in grade crossings and other projects for which the federal government pays 100 percent. A total of $256,890 in state funds was set aside for WPA projects on which the state pays 25 percent and the WPA 75 percent on work and material. Of the entire budget, the federal government will provide $5,809,354 and the state $5,215,437.50.

CONTRACTS AND CAPITAL

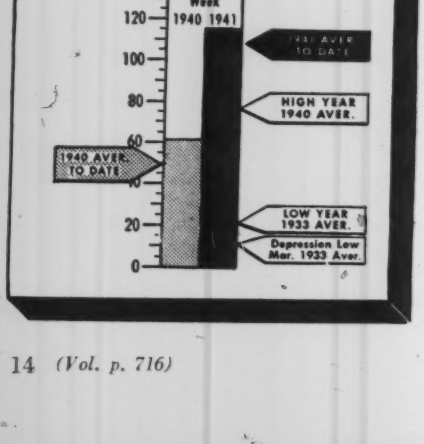
ENGINEERING CONSTRUCTION awards for the week, $119,425,000, are 93 percent above the volume for the corresponding 1940 week, and 11 percent higher than last week. Public construction tops last year by 140 percent, and is up 52 percent compared with last week. Private awards gain 0.3 percent over a year ago, but are 51 percent below a week ago.

The current week's construction awards bring the 1941 total to $1,962,236,000, an increase of 114 percent over the volume for the opening 18-week period last year. Private awards, $532,619,000, are 66 percent higher than in the period a year ago, and public construction, $1,429,617,000, is 140 percent higher, due to the 815 percent increase in federal work.

In the classified construction groups, gains over last week are in bridges, industrial buildings, public buildings, earthwork and drainage, and streets and roads. Comparisons with a year ago reveal increases in bridges, commercial building and large-scale private housing, public buildings, streets and roads, and unclassified.

New capital for construction purposes for the week totals $11,759,000, a decrease of 56 percent from the volume for the 1940 week. The week's new financing is made up of $8,509,000 in state and municipal bonds, and $3,250,000 in corporate security issues.

New construction financing for the year to date, $3,059,543,000, tops the $391,895,000 reported for the 18-week period last year by 680 percent.



CONTRACTS

(Thousands of dollars)

	Week Ending May 2 1940	April 24 1941	May 1 1941
Federal	$14,370	$37,820	$69,107
State & Municipal	26,697	27,033	29,578
Total public	$41,067	$64,853	$98,685
Total private	20,679	42,237	20,740
TOTALS	$61,746	$107,090	$119,425
Cumulative 1941 (18 weeks)			$1,962,236
1940 (18 weeks)			$916,303

Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1940 18 weeks	1941 18 weeks
NON-FEDERAL	$391,895	$340,706
Corp. Securities	70,599	108,962
State & Mun.	242,323	192,053
U.S.H.A. loans	73,551	13,521
R.F.C. loans	5,512	26,170
FEDERAL		$2,718,837
TOTAL CAPITAL	$391,895	$3,059,543

FHA MORTGAGES

	Week Ending Apr. 27 1940	Apr. 19 1941	Apr. 26 1941
Selected for appraisal	$28,737	$34,820	$36,154*
Cumulative 1941 (17 weeks)			$452,971*
1940 (17 weeks)			$384,486

* Subject to revision.

ENR INDEX NUMBERS

Index Base=100		1913	1926
Construction Cost	Apr. '41	252.40	121.33
Building Cost	Apr. '41	298.60	112.76
Volume	Mar. '41	386	169

OBITUARY

CARLO BIANCHI, 70, founder, general manager and treasurer of the C. Bianchi Construction Co., Inc., Framingham, Mass., died April 24 at Natick, Mass.

WILLIAM H. PARK, project engineer of the Minnesota State Highway Department, died last week at St. Paul, Minn.

JOHN F. BLACK, for 35 years an engineer in the Providence, R. I., water department, died in that city on April 20.

FRANCIS L. SELLEW, 56, district waterways engineer of the Massachusetts department of public works, and a member of the staff of that organization for 34 years, died at Natick, Mass., April 12.

WILLIAM D. SUTTON, a civil engineer in the employ of the state of Rhode Island, died in Providence on April 20.

F. B. FRIPP, formerly harbor engineer of the Canadian National Railroad, died recently at Victoria, B. C. Mr. Fripp was 75 years old.

ARTHUR W. BURGHARDT, 62, a structural engineer for the Belmont Iron Works, died April 19 at Philadelphia, Pa.

ANTONIO MADRAZO, 56, widely known Mexican civil and military engineer, formerly general manager of the National Railways of Mexico, died recently at his home in Leon, Guanajuato State.

ERNESTO E. URIEGA, 49, of the Mexican national highway commission's civil engineering staff, was killed recently while working on the Mexico City-Pachuca highway.

E. MCLELLAN BALKAM, district highway engineer for Charlotte county, New Brunswick, died recently at Milltown, N. B.

JOHN H. SCHUMACHER, widely known in northwestern engineering circles, and president of the firm of Schumacher-MacKenzie, Ltd., died recently at Winnipeg, Man.

GEORGE W. STEED, construction engineer, of Janesville, Wis., was killed recently in an automobile accident.

RONALD J. MACINTYRE, 72, for many years a contractor at Providence, R. I., lost his life from a fall in that city on April 24.

CHARLES BEACH NOLTE, president of the Crane Company, died April 29 at Chicago. Mr. Nolte was 55 years old. He was a director of R. W. Hunt Co.

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

BRIDGE AND APPROACHES GEORGIA

OWNER: Georgia State Highway Department, Atlanta, Ga.

PROJECT: Construction of overhead bridge and concrete paved approaches at Central of Georgia RR. crossing of Atlanta-Griffin Road, near Experiment, Spalding County, Ga.

CONDITIONS: Contractor to furnish all materials and complete work in 180 working days. Highway transportation facilities available. Wage rates stipulated are: skilled labor, 60c. per hr.; semi-skilled, 40c.; and common, 30c.

BIDS: Eight bids were received January 3, 1941, ranging from the contract low of $44,590 to $59,408.

LOW BIDDERS:

1. John Monaghan, Inc., Pelham, Ga. (contract) $44,590
2. Coffee Constr. Co., Eastman, Ga. 45,546
3. S. B. Slack, Decatur, Ga. 47,071

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Clear and grub	L. S.	$250.00	$300.00	$120.00
1a. Clear and grub	L. S.	50.00	100.00	30.00
2. Common borrow excav., incl. shoulders	20,489 c. y.	.26	.30	.25
3. Ditch excavation	157 c. y.	.50	.30	.50
4. Hydraulic settlement of fills	5,000 c. y.	.05	.10	.04
5. Overhaul on excavation	398,208 sta. y.	.0012	.005	.003
6. 15-in. corr. met. pipe, sidedrain	40 l. f.	2.00	1.25	1.25
7. 15-in. corr. met. pipe sidedrain exten.	20 l. f.	2.00	1.25	1.25
8. 15-in. std. str. rein. conc. pipe, exten.	12 l. f.	2.50	1.50	1.50
9. Remove culvert pipe	18 l. f.	1.00	.50	.50
10. Remove and relay culv. pipe	20 l. f.	1.50	1.00	1.00
11. Retaining walls, conc.	59.04 c. y.	22.00	30.00	22.00
12. Cl. A conc. guard rail constr.	2.6 c. y.	24.00	30.00	30.00
13. Reinforcing steel	848 lb.	.06	.10	.053
14. Grassing shoulder slopes	34,833 s. y.	.03	.03	.025
15. Conc. right-of-way markers	6 ea.	3.00	2.00	2.50
16. Com. excav. for rounded cut slopes	200 l. f.	.05	.04	.03
17. Riprap	80 s. y.	.50	.50	.50
18. Cem. grouted rubble flume	30 s. y.	2.00	3.00	2.50
19. Remove cem. grouted rubble spillways	5 ea.	5.00	5.00	3.00
20. Wire mesh guard fence, remove and store	1,620 l. f.	.12	.05	.06
21. Remove concrete paving	2,893.22 s. y.	.30	.30	.25
22. Remove, reset conc. r.-o.-w. markers	8 ea.	2.00	2.00	2.00
23. 9-6-9-in. pl. cem. conc. pavement	3,085.55 s. y.	2.40	2.10	2.30
24. Rein. conc. approach slabs	115.54 s. y.	4.50	4.50	5.00
25. Raised edge curb	2,374 l. f.	.05	.07	.07
26. Resilflex guard rail, type C conc. posts	1,472 l. f.	1.00	1.00	.91
27. Conc. spillways, type 1 and 2	6 ea.	22.00	25.00	18.00
28. 8-in. corr. met. pipe slope drain	116 l. f.	1.00	1.00	1.00
29. Conc. drop inlet spillways, type A	2 ea.	30.00	60.00	42.00
30. 9x6-in. conc. header, raised edge curb	29.8 l. f.	1.00	1.00	.70
31. Finish and dressing	28,333 s. y.	.013	.02	.03
32. 10-in. corr. metal pipe slope drain	120 l. f.	1.10	1.00	1.00
33. Class A. concrete	395 c. y.	25.50	26.00	30.00
34. Reinforcing steel	53,000 lb.	.045	.05	.053
35. Structural steel	L. S.	6,500.00	6,500.00	7,700.00
36. Timber piling treated (16 lb.)	2,440 l. f.	.80	.70	.90
37. Excavation, class 1	450 c. y.	4.50	1.50	1.70
38. Excavation, class 2	91 c. y.	2.00	2.00	2.00
39. Test piles	2 ea.	100.00	100.00	300.00
40. Clear and grub	L. S.	100.00	50.00	50.00
41. Remove existing bridge	L. S.	400.00	50.00	250.00

WATER SUPPLY DAM WEST VIRGINIA

OWNER: Beckley Water Co., Beckley, W. Va.; W. D. Kelley, engineer.

PROJECT: Construction of a concrete gravity type dam on Glade Creek, in Raleigh County, West Virginia, for water supply. Height 35 ft.; length 360 ft.

CONDITIONS: Owner to furnish sluice gate, trash racks, screens, piping, fittings and valves, contractor to furnish balance of material and complete work in six months. Rail and highway transportation facilities available. Approximately 15 percent Cyclopean stone permitted: Local sandstone suitable for Cyclopean stone and coarse aggregate. Low bidder, however is considering importing all aggregate by rail, with 7½-mile haul over improved highway from railhead to dam site. Common labor rate on project ranges from 40 to 45c. per hr.

BIDS: Ten bids were opened February 14, 1941, ranging from the low of $105,870 to $142,760. Engineer's estimate, $113,200.

LIST OF BIDDERS:

1. C. C. Dodd Constr. Co., Spencer, W. Va. $105,870
2. Vecellio & Grogan, Beckley, W. Va. 109,050
3. Pocahontas Constr. Co., Lewisburg, W. Va. 109,332
4. Janutolo & Co., Fayetteville, W. Va. 116,615
5. McDowall & Wood, Roanoke, Va. 117,670
6. Geo. H. Siems & Co., Mt. Hope, W. Va. 119,376
7. W. A. Wilson & Co., St. Marys, W. Va. 124,720
8. Price Constr. Co., Huntington, W. Va. 127,470
9. F. L. Showalter, Lynchburg, Va. 135,230
10. Monty Bros., Charleston, W. Va., and Oscar Vecellio, Itman, W. Va. 142,760

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Diversion and care of stream	L.S.	$1,000.00	$1,000.00	$1,000.00
2. Clearing dam site	L.S.	500.00	75.00	200.00
3. Excavation, general	13,500 c. y.	.60	.65	.55
4. Excavation, rock	1,500 c. y.	1.50	5.00	2.10
5. Overhaul	10,000 sta. y.	.04	.01	.05
6. Backfill, tamped or puddled	1,000 c. y.	.70	.20	.65
7. Test drilling	400 l. f.	1.00	.40	1.00
8. Foundation grouting	200 bag	1.00	2.00	4.00
9. Class A concrete	200 c. y.	16.00	13.00	14.54
10. Class B concrete	7,300 c. y.	12.00	11.90	12.40
11. Reinforcing steel	8,000 lb.	.05	.06	.05
12. Copper water stops	500 ll. f.	.60	.70	.65
13. Handrail, single rail	160 . f.	2.00	1.50	2.00
14. Handrail, double rail	160 l. f.	3.00	2.50	4.00
15. Install pipe fittings, valves, etc.	L.S.	500.00	300.00	500.00

UNDERPASS, SOUTH CAROLINA

OWNER: South Carolina State Highway Dept., Columbia, S. C.; W. J. Gooding, chief bridge engineer.

PROJECT: Construction of treated timber, reinforced concrete and structural steel underpass under Seaboard Air Line RR. on Main Street, Darlington, S. C. Length approximately 101 ft.

CONDITIONS: Contractor to furnish all materials and complete work in 180 calendar days. Rail and highway transportation facilities available. Wage rates specified are: skilled labor, 55c. per hr.; semi-skilled, 35c.; and common, 30c.

BIDS: Six bids were opened January 21, 1941, ranging from the contract low of $27,186 to $37,589.

LIST OF BIDDERS:

1. Joseph W. Barnwell, Jr., Columbia, S. C. (contract) $27,186
2. F. A. Triplett, Chester, S. C. 29,263
3. Davis Moragne, Columbia, S. C. 30,305
4. C. Y. Thomason Co., Greenwood, S. C. 32,757
5. Vincennes Steel Corp., Vincennes, Ind. 34,777
6. M. L. Stephenson, Charleston, S. C. 37,589

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Wet and dry excav.; bridges	85 c. y.	$2.00	$2.00	$3.00
2. Cl. A cement concrete	139.5 c. y.	30.00	28.00	30.00
3. Reinforcing steel	13,818 lb.	.05	.05	.06
4. Untr. struct. timber	17.178 M bm.	40.00	60.00	80.00
5. Treat. struct. timber	8.972 M bm.	115.00	100.00	150.00
6. Steel superstr., incl. painting	L. S.	16,000.00	17,000.00	16,500.00
7. Untr. timber piling	850 l. f.	1.00	.70	1.00
8. Creosoted timber piling	1,980 l. f.	1.20	1.25	1.50
9. Supporting, rolling and lowering superstr.	L. S.	1,200.00	2,500.00	2,000.00

CONSTRUCTION REPORTS

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York
ELSIE EAVES, Manager *SCOTT McLEOD, Statistician*
(Daily service also available—Write for details)

Location of ENR Correspondents

Symbols and Abbreviations Include:

† Federal Government
★ Project of $500,000 or over
ENR Engineering News-Record
CD Construction Daily

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger; water supply, earthwork, waterworks, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

Classes of Construction
(Named in order of Listing)

Water Supply	Unclassified
Sewers, Waste Disposal	Latin America
Bridges, Grade Cross'gs	Public Buildings
Streets & Roads	Commercial Buildings
Earthwork, Waterways	Industrial Buildings

Stages Reported

PROPOSED: (except Streets & Roads):
BIDS ASKED (new announcements only. For full calendar, see also preceding issues of ENR):
LOW BIDDERS: All low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issues in which last previous report was published.

WATER SUPPLY

PROPOSED WORK

†Calif., Jolon—Con. Q.M., 9 Corps Area, Presidio, San Francisco, completing specifications 8 water wells on Hunter-Liggett Military Reservation.

Calif., Los Angeles—Dpt. Water & Power, 207 S. Bway., rejected bids Apr. 18, 1,650 lin. ft. rein.-con. water pipe line, Rowena Ave. to Ivanhoe Reservoir, Spec. 3660. Over $15,000. CD 4/8—ENR 4/10.

Calif., San Francisco—City and County of San Francisco, exten. WW sys. $100,000 appropriated by Bd. Supervs. L. T. McAfee, ch. engr. P. Utilities Comn., 425 Mason St., engr.

Kan., Council Grove—$80,000 bond election May 6, WW sys.

†N. H., Portsmouth—Yards & Docks, Navy Dpt., Wash., D. C., elevated steel water storage tank, Spec. 10,385.

N. Y., New York—Dpt. Water Supply, Gas & Electricity, Municipal Bldg., 2 story pump. plant, 109-22 St. Marks Ave., Rockaway Beach. $100,000. T. Hochlerner, c/o owner, engr.

N. Y., Niagara Falls—W. D. Robbins, city mgr., 7,284 lin. ft. watermain replacements, extens. Over $25,000. H. W. Clark, city engr.

Pa., Ligonier—Rolling Rock Country Club, Ligonier, 250,000 gal. underground water reservoir, parking area for autos on top, c.i. watermains, etc. $15,000.

S. D., Centerville—Iron Removal plant. $15,000. Dakota Eng. Co., Mitchell, engrs.

†Tex., Brownwood—Con. Q.M., Fort Sam Houston, 1 m.g. water reservoir, Camp Bowie. $200,000.

Tex., Dallas—V. R. Smitherman, city mgr., completed plans watermains, etc. $63,600. H. A. Hunter, city engr.

★**Tex., Galveston**—B. Harris, mayor, bond election May 13, WW imprvs. $500,000. CD 3/27—ENR 4/3.

Wash., Granite Falls—Two 75,000 gal. concrete reservoirs, 2 wells, pump. sys. $33,007. Sievers & Duecy, Everett, engrs.

Wis., Wisconsin Rapids—Consolidated Water Power & Paper Co., Wisconsin Rapids, rein.-con. dam, steel gates, gravity wall structures across Wisconsin River. T. Utegaard, c/o owner, engr.

BIDS ASKED

Bids Asked May 6

Mass., Leominster—Office Water Comr., City Hall, water filtration plant. Over $15,000. H. E. Bailey, 177 State St., Boston, engr.

Bids Asked May 7

Pa., Ambridge—Boro, S. L. Card, clk., 1 story, 14x55 ft., brick, hollow tile water filtration plant addn. $80,000. Chester Engineers, 210 E. Parkway N. S., Pittsburgh, engrs.

Bids Asked May 13

Calif., San Francisco—Pub. Utilities Comn., City Hall, Alemany Blvd. Pump. Sta., WD 280, for City and San Francisco Co.

LOW BIDDERS

†Ariz., Phoenix—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., Apr. 16, pump. plant, Phoenix Military Airport, near Litchfield Park, from Fritz Ziebarth, 820 W. Esther St., Long Beach, Calif. **$31,935.** CD 4/15.

Calif., San Diego—City, Apr. 16, Mission Valley pipe line, incl. 23,900 ft. c.i. pipe, from V. R. Dennis, Mission Gorge Rd. **$59,950.**

Conn., Hartford—Bd. Contr. & Supply, Metropolitan Dist., Municipal Bldg., 550 Main St., Apr. 21, 1.625 mi. 20 in. rein.-con. cylindrical pipe line, Conn. Blvd., Sullivan Dr., Pitkin and Main Sts., East Hartford, Contr. 64, from F. B. O'Neil, 22 Preston St. **$34,298.** CD 4/9—ENR 4/17.

★**Ind., Oaklandon**—Indianapolis Water Co., H. S. Morse, exec. vice pres., Monument Circle, Indianapolis, Apr. 15, reservoir, 500 rein.-con. dam, Fall Creek, near here, from Smith & Johnson, 1799 Kentucky Ave., Indianapolis. **$625,245.** Total est. $1,600,000. CD 3/25—ENR 3/27.

Mo., Kansas City—City, c/o L. P. Cookingham, city mgr., Apr. 22, Contr. E1, from Link Belt Co., 307 N. Michigan Ave., Chicago, Ill., **$18,043;** Contr. E2, from Omega Mchy. Co., 4010 Pennsylvania Ave., **$19,497** ***Contr. E3, from Dorr Co., Inc., 221 N. La Salle St. Chicago, Ill., **$196,000.** Est. $250,000. CD 4/7—ENR 4/10.

†Utah, Ogden—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., rein.-con. water supply reservoir, Hill Field, from Jacobsen Constr. Co., 724 S. 3 St. E., Salt Lake City. **$48,800.** CD 4/11.

†Wash., Fort Lewis—Con. Q.M., Apr. 21, deep water well, 41st Div. National Guard Cantonment, Inv. 6105-41-88, from N. C. Jannsen Drilling Co., 9107 E. Marginal Way, Seattle. **$18,252.**

CONTRACTS AWARDED

Mass., Boston — Commonwealth of Mass., Metropolitan Dist. Comn., Water Div., 20 Somerset St., Contr. 132, furnishing water pipe, special castings, to U. S. Pipe & Fdry. Co., 250 Stuart St. **$46,630.** CD 4/3—ENR 4/10.

Mich., Redford Twp. (Detroit) — Redford Twp., watermain distr. sys., Sect. 1, to R. L. Coolsaet, 7600 Middlesex Ave., Dearborn, **$66,374;** Sects. 2, 3 and 4, to Drainage Contractors, Inc., Schaefer Rd., Dearborn, **$153,322.** Bids 3/15. CD 3/10.

Tex., Burkett—Coleman Co. Fresh Water Supply Dist. 2, earth and concrete dam to impound 65 acre ft. water, in 520 acre drainage basin, **WPA. $71,000.** CD 2/27—ENR 2/29.

Tex., Grand Prairie—J. W. Trimble, city finance comr. WW sys. imprvs., drilling, casing, developing deep well, 2 booster pumps, etc., **WPA. $77,200.** CD 3/19—ENR 3/27.

†Tex., Houston—U. S. Eng., Federal Bldg., Galveston, deep water well, water supply pressure sys., Ellington Field, to Layne-Texas Co., 6931 Harrisburg St. **$50,350.**

Tex., Lubbock—C. Staton, mayor, 78x300 ft. rein.-con. reservoir, 5 m.g. capacity, to Panhandle Constr. Co., Lubbock. **$58,759.** Est. $60,000.

Tex., Throckmorton—S. Stribling, mayor. WW imprvs., filter plant, riprapping dam, sodding, **WPA. $70,300.** CD 4/10—ENR 4/17.

Wash., Pomeroy—Watermain imprvs., **WPA. $30,112.** CD 4/15—ENR 4/17.

Wis., New Lisbon—Chicago, Milwaukee, St. Paul & Pacific R.R. Co., W. H. Penfield, ch. engr., Union Station, Chicago, Ill., 100,000 gal. water tank, to Pittsburgh-Des Moines Steel Co., 1015 Tuttle St., Des Moines, Ia. **$15,000.** CD 2/26—ENR 3/6.

Wyo., Pine Bluffs—Water distr. sys. imprvs., street work, **WPA. $35,000.**

SEWERS, WASTE DISPOSAL

PROPOSED WORK

Calif., Lakeport—Will form sewer dist. to finance construction sewers west end of 2, 3 and 4 Sts. $25,000 or more.

Calif., Los Angeles—Los Angeles Co., Hall of Records Bldg., 4 mi. sanitary sewer, Gafford and other streets, County Imprvt. 1928, $42,861. A. Jones, Hall of Records, engr.

Calif., Madera—$65,000 bond election June 5, sewer and watermain exten., fire hydrants, etc. CD 3/12—ENR 3/20.

Calif., San Francisco—City and County of San Francisco, sewers. $400,000. J. J. Casey, city engr.

Calif., Santa Cruz—Bond election soon sewerage sys. imprvs. $250,000.

Ill., Rushville—I. Payton, city clk., defeated bonds, sewage treatment plant, sewers, $66,000. CD 4/10—ENR 4/17.

Mo., Mission Twp. (RFD from Kansas City)—Mission Twp., in Jackson Co., constructing sewer dist. $30,000.

Mo., St. Louis County—Hanley Sewer Dist. of St. Louis Co., c/o E. A. Fulton, engr., 2 S. Meramec Ave., Clayton, St. Louis. $90,000 bond election May 9, sanitary sewerage sys.

Mo., St. Louis County—Science Hill Sanitary Sewerage Dist. of St. Louis County, c/o G. W. Kropp, engr., 26 N. Meramec Ave., Clayton, St. Louis, sanitary sewers. $25,000. Hearing on petition for incorporation in St. Louis County Circuit Court, May 3.

N. J., Trenton—Hamilton Twp., Township Hall, Greenwood Ave., sanitary sewers. $52,100. WPA. W. D. Couple, 1102 S. Broad St., Trenton, WPA and owner's engr.

N. Y., Elmira Heights—Sewage disposal plant, sewerage sys. $100,000.

N. Y., Jamestown—Dpt. P. Wks., C. J. Strandburg, dir., City Hall, main line trunk sanitary line from Boatlanding Dist. across city to present disposal plant, east end $200,000; preliminary plans, surveys, sewage disposal plant, Fluvanna Ave. sect., $150,000-$200,000. C. E. Elmendorf, 56 Elmdorf Ave., Rochester, engr.

Pa., Hanover Twp. (Wilkes-Barre P. O.)—Supervs. Hanover Twp., Lee Park, Wilkes-Barre, sanitary sewers, Claymont Ave., drainage sys. Spring St., riprapping Solomon's Creek, through twp., repairing, imprv. sewage disposal plant. Over $25,000.

Tex., Galveston—B. Harris, mayor, bond election May 13 incinerator plant, $50,000; imprv., enlarging sanitary sewerage sys. $50,000. CD 4/2—ENR 4/10.

BIDS ASKED

Bids Asked May 5

N. Y., Jamaica—Supt. School Bldgs., Design & Constr., 49 Flatbush Ave. exten., Brooklyn, private storm sewer for addn. to P. S. 46, Union Hall St. and 109 Ave. and 160 St.

Bids Asked May 6

Kan., Emporia—E. T. Mendel, city clk., sewage disposal plant. $75,000. R. W. Cunningham, city engr. CD 4/22—ENR 4/24.

N. Y., Brooklyn—President Brooklyn Boro, Boro Hall, storm and sanitary sewers Avenues K and L, E. 91, E. 92 and E. 93 Sts.

Bids Asked May 7

Pa., Phila.—Dpt. P. Wks., Bureau Eng., Surveys & Zoning, City Hall Annex, sewers. Over $25,000. J. H. Neeson, dir., c/o owner.

Bids Asked May 8

O., Cleveland—F. Foy, city purch. agt., City Hall, sewer tunnel in Center and Riverbed Ave. to Carter Rd. $210,000. J. W. Wenrick, city engr. CD 3/31—ENR 4/3.